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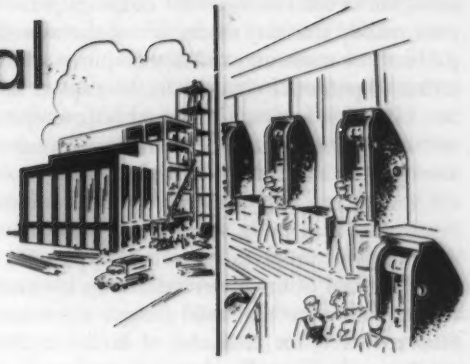
Business Capital Requirements



THE POSTWAR YEARS have generated an impressive record of economic expansion in the United States. Measured in terms of constant dollars, production and income have increased about 30 per cent since 1946. While this growth in economic activity has evolved in part from an enlarged labor force and improved technology, gains also have come from more extensive and intensive use of capital. Business firms have played a dominant role in this process of increasing the stock of capital through replacement, modernization, and expansion of plant and equipment, as well as through improvement of inventory positions. Recent years have seen the establishment of successive records for business investment—last year's estimated total of 42.5 billion dollars exceeding the 1929 total by about 66 per cent, after adjustment for change in price level. This phenomenal volume of capital formation in recent years naturally raises questions regarding the effect upon the over-all stock of capital in relation to present and future needs. Has the stock of business capital been greatly over-expanded by recent investment rates? What volume of capital needs does business foresee in the near future? What implications does this have for the national economy?

This article summarizes important changes which have taken place in rates of business capital formation during recent decades and offers a tentative evaluation of the present position. As part of an evaluation of general economic prospects, this discussion offers a rough indication of the extent to which current outlays exceed past expenditures for replacement and growth. Obviously, no precise measure of normal growth or the volume of backlog demands can be made, but analysis of long-term trends and recent performance provides approximations from which useful conclusions may be drawn.

The machinery, equipment, buildings, and other permanent structures employed by business, together with business inventories of raw materials, semifinished, and finished products, comprise the capital facilities which are dealt with here. These assets generally are distinguished from other physical assets—such as houses, land, highways, automobiles, and so forth—by their ownership, by the fact that they are reproducible, or by reason of their part in future production of an end product. Capital goods usually are defined as a type of wealth accumulated from past productive efforts and destined for implementation of future production. The stock and condition of such assets, therefore, are determinants not only of the present material well-being of an economy, but also of the potential for increased productivity.

Considering business capital requirements as a part of total demand for output, it can be seen readily that any discussion of the over-all problem of economic stability requires recognition of potential changes in the capital sector. Likewise, forecasts of actual future capital demands must be made within a framework of assumptions regarding demand for final product in the rest of the economy, for business investment is notably sensitive to prospective utilization of proposed plant and equipment. This problem of the interrelationship between capital formation and total output is not emphasized here, for estimates of future capital requirements generally are predicated upon an assumption of high level employment and production.

In analyzing past trends in investment, as well as potential future requirements, it is useful to draw certain distinctions. So-called fixed capital may be separated from working capital and gross investment distinguished from net investment. Fixed capital refers largely to buildings and machinery or other equipment – producers' assets having an extended life and used again and again in the productive process. Against this type of asset may be contrasted elements remaining in the possession of a given firm for relatively brief periods. This category includes inventories, cash, notes, and accounts receivable.

Demands for capital arise both from the need for additions to the existing stock of facilities—perhaps to satisfy a growing population, to meet shifts in location of supplies or markets, or to produce new goods—and from the need to replace wornout or outmoded capital elements. The normal continuing processes of deterioration added to the unpredictable introduction of technological improvements in durable producers' goods are responsible for a large volume of capital formation annually, entirely apart from additions to facilities. The sum of these two classes of demand for capital—replacement and additions—is referred to as "gross" investment, whereas the element representing only growth in the stock of capital is termed "net" investment.

Historical Relation of Capital Outlays to Gross National Product

Expenditures by business on capital goods have shown considerable fluctuation historically, upward and downward movements being timed generally with similar changes in over-all economic activity. Total capital outlays of business, as indicated by expenditures on durable producers' equipment, private nonresidential construction, and changes in inventories since 1920, ranged from less than 1 billion in 1932 to 48 billion in 1951 measured in 1951 prices. During periods of high economic activity, capital expenditures normally rise both in dollar terms and as a proportion of total product. From 1925 to 1929, for instance, business capital formation proceeded at an average rate of slightly over 11 per cent of gross national product. From 1932 through 1934, on the other hand, the average was just over 2 per cent. The bulk of nonmilitary capital demands was postponed from 1942 through 1945. Aside from defense and defense-related installations, total capital formation amounted to less than 4 per cent in these years. Business investment in the postwar years 1946 through 1953 moved up sharply from the wartime level, averaging about 12 per cent annually. This represents a slightly larger proportion of gross national product than was absorbed by business investment in the period 1925-29.

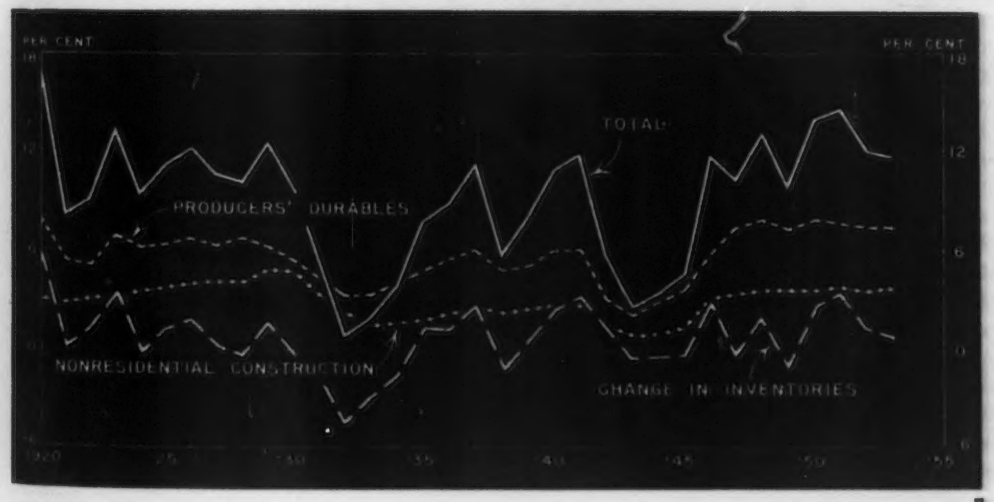
Certain differences in the distribution of outlays in recent years as compared with the twenties are apparent, moreover. In the earlier period, construction was a larger fraction of total capital expenditures than in the postwar period. From 1925 to 1929, nonresidential construction averaged 37 per cent of total capital

formation annually. Since 1945, construction has represented less than 25 per cent of annual business outlays for capital. Changes in relative prices of plant compared with equipment serve to emphasize rather than to offset these differences. Relative prices of new construction increased approximately 125 per cent from 1929 to 1950, whereas the index of producers' durable equipment prices rose about half this amount. Thus, if prices were the only factor, construction outlays as a fraction of capital expenditures would have increased rather than decreased. This trend toward relatively greater equipment expenditures, which also holds if the data are extended back to 1869, seems plausible in that the fraction of construction would be expected to decline as population growth slowed and as the basic network of fixed capital was completed. Examination of commercial construction statistics—warehouses, office buildings, stores, restaurants, and so forth—from the present back to 1920, the earliest date for which commercial construction is recorded separately, bears out this expectation. The statistics show that these elements have failed to increase in the postwar years in proportion to other nonresidential construction or to capital expenditures as a whole. Moreover, railroad construction outlays since 1945 have been a lesser proportion of capital expenditures, and the average annual dollar outlays have been less than in the twenties.

The information on gross business capital formation for the twenties together with estimates of capital consumption indicates that net additions to the stock of business capital in that period were in line with the trend for the preceding four decades. This proximity to the trend of net capital formation does not prove that such outlays represented some sort of "sustainable" level of investment, but neither does it support the assumption that net capital formation was excessive in terms of providing capacity to meet anticipated future demands for final product.

Gross Business Investment, 1920-53

Expressed as percentage of gross national product



The great depression of the thirties produced a drastic reduction in capital formation. Net capital formation was negative in most years, and total business assets declined for the decade as a whole. Gross investment in nonresidential construction, durable producers' goods, and net inventory investment averaged about 5 billion dollars per year, whereas depreciation allowances averaged 6.8 billion dollars per year.

With the onset of preparation for war in 1939, Government expenditures furnished a vigorous stimulant to the American economy, and employment and production rose rapidly. Successive new production peaks were established from 1941 through 1945. The share of this enlarged output employed for capital formation, however, remained at the depressed levels of the previous decade. The gains in production were obtained mainly through an increase in the number of persons employed, longer hours, and more intensive use of existing plant and equipment. Aside from Government-financed defense plants, relatively little expansion of plant and equipment occurred. Data indicate that from 1942 through 1944, gross business outlays on capital were insufficient to meet estimated depreciation. Thus, there was no general increase in the book value of business capital during the period of hostilities. While population and income were increasing, privately owned productive capacity showed little change in volume and increased in average age. In this sense, the backlog of capital needs existing in 1941 was increased during the war. Adaptation of war-born Government plant and equipment to civilian use following the close of the war probably offset this deficiency to some degree, but the heavy concentration of war facilities in certain industries—shipbuilding and ammunition, for example—limited the gain from this source.

Trend of Durable Equipment Expenditures

The evidence cited above of deficiency in business capital formation from 1930 through 1945 is supported by movements of the U. S. Department of Commerce series on durable equipment expenditures alone for the years 1869 through 1953. There is a clear upward movement in this series from 1869 through 1930, a trend line indicating average annual growth of about 3 per cent. That such growth in outlays should be recorded is plausible in view of the rapid expansion of population and progress of industrialization in this era, together with the fact that, as the total stock of durable equipment grew, replacement requirements also were increased.

From 1930 through 1945, however, expenditures for producers' durables show wide deviations from this trend. Outlays declined sharply from 1930 through 1932, and, though they rose generally from 1932 through 1945, were below the long-term trend. From 1945 through 1953, expenditures for durable equipment were well above the trend. In 1951, 1952, and 1953, the rate of equipment expenditures averaged more than 25 billion dollars at current prices, the highest 3-year average on record.

In summary, plant and equipment expenditures of business from 1930 through 1945 appear to have been insufficient by standards of earlier decades. Not only were outlays inadequate to provide growth in productive capacity of the economy, but they also were insufficient to offset the continuing shrinkage of facilities through wear and tear. Thus, at the beginning of the postwar period, business generally found itself in need of large additions to durable facilities, both to meet enlarged demand for the final product and to compensate for the previous failure to maintain the existing stock of assets.

Insofar as business inventories are concerned, the end of the war found aggregate

stocks at about the 1930 level, although real output had more than doubled. On the assumption that inventory needs are related fairly directly to sales volume and that the level in 1930 was not highly excessive relative to sales, it follows that inventory needs in 1945 were considerably in excess of existing levels. Even allowing for some speeding up in handling and utilization of materials, a backlog of demand also existed for inventory capital.

Measuring the Backlog of Capital Needs

There have been a number of measurements of the backlog of investment need at the close of World War II. These studies have employed various methods and reached somewhat differing conclusions. While it is beyond the scope of this discussion to describe and evaluate these, it may be useful to comment briefly on certain aspects of such studies and to indicate the general range of answers furnished.

Possibly the most commonly used method of measuring capital needs is based upon the relation of the stock of capital to capacity. A long-term average relationship is established between capacity and stock of capital and compared with the ratio at any point for which a measurement is to be made. Capacity, for this purpose, is generally measured in terms of output in selected years of approximately maximum use of resources. The deficiency or surplus is simply the difference between the long-run relationship and that of the period in question. Estimating procedures also employ an entirely different principle for determining capital needs. This second method is based upon the relationship of gross capital outlays to growth of capacity. Using the increase in output between two or more successive periods of high employment to represent change in capacity, investment outlays are calculated for the intervening span of time, and the ratio established between the investment total and the change in capacity. Given the expected growth in output, the necessary volume of capital formation can then be determined from the ratio.

All estimates compiled on these bases encounter certain fundamental difficulties. It is necessary first to project some rate of growth in gross national product which may be regarded as fairly sustainable. Such projections are necessarily problematical. Beyond this, one must assume that the relationship between the stock of capital and a given volume of output, or between the increment in capital and a given increase in output, is stable. Neither of these can be established confidently. Although the ratio of stock of capital to capacity may have held nearly constant for some considerable period in the past, it has risen sufficiently in recent years to make projection uncertain. This change in the ratio may have come about as a result of changes in average productivity of capital, enabling a given stock or a given additional investment to yield a larger product; it may have arisen from lengthening the average life of capital goods, thereby overstating the amount of depreciation and understating the existing stock of capital; or it may have arisen from other causes.

Quite apart from the reliability of methods depending upon projection of past relationships, calculations of business capital requirements at the close of World War II vary widely. Obviously, small differences in the assumed rate of growth in gross national product, in average productivity of capital, or in average service life result in wide differences in final estimates. It is not surprising, therefore, to find the estimated backlog of postwar investment need ranging from 50 billion to 100 billion dollars at current prices, and the time calculated for overcoming the deficiency ranging from 10 to 20 years. These projections assume that economic activity will continue at

or near full employment and that no important increases will occur in military expenditures.

Postwar Business Investment

The rate of business investment in the postwar years, by the criterion of any previous 8-year period, was impressive. Outlays for producers' durable equipment ranged from 12 billion dollars in 1946 to nearly 27 billion in 1953. Similarly, nonresidential construction rose from 5.6 billion in 1946 to 13.3 billion dollars last year. Finally, inventory growth, though less regular on an annual basis, averaged about 4 billion dollars per year. These data, of course, are affected by the rising prices of recent years, but represent, nevertheless, a record of sustained high investment. Even after adjustment for the difference in price level, the postwar years have seen business investment at an average annual rate at least 50 per cent above that in the twenties. It is unnecessary to analyze here the diverse demands which make up this total, but there is little reason to doubt that, for the composite of all industries, postwar outlays for plant and equipment have involved substantial catching up with deferred need for capital expansion.

On the other hand, recent surveys of business investment plans show that there continues to be a backlog of deferred replacement and modernization demand. Although obsolete and relatively inefficient, much plant and equipment has been continued in service to meet the high level of postwar demand for final product. A recent McGraw-Hill survey of investment intentions tends to verify this trend toward modernization as compared with expansion. Whereas capital spending of manufacturers included 49 per cent for new plant in 1952 and 51 per cent for modernization, expansion last year represented only 48 per cent as against 52 per cent for modernization, and plans for 1955-57 show only 39 per cent for expansion and 61 per cent for modernization.

Summary

Outlays for business capital since 1945 are generally regarded as somewhat in excess of the long-term peacetime needs of the American economy. The postwar rate of capital formation, therefore, has permitted appreciable reduction in the backlog of deferred growth and replacement which had accumulated over the 15-year period 1930-45. Exactly how much of this backlog has been eliminated is difficult to assess for the economy as a whole. Undoubtedly, some industries have larger remaining capital deficiencies than others.

Modernization of older plants appears to have become a relatively more important part of investment plans, demonstrating that businesses are planning the incorporation of new technical developments into their facilities. This trend also may have the effect of reducing the backlog, for it is likely that modernization in many instances involves capital-saving innovations, or increases in average productivity of capital. However, growth of the economy, the trend toward mechanization, and normal replacement needs indicate that business capital requirements will continue to be substantially above the level of the twenties. It should be understood, of course, that the existence of capital needs in the form of backlogs, as well as of currently developing growth and replacement requirements, is not synonymous with business decisions to make replacements or establish new capacity. It must be anticipated that fluctuations in business expectations will produce corresponding variation in the volume of investment outlays during given periods. Nevertheless, capital expenditures should be regarded as an important element in any appraisal of long-term total demand.

SECURITY OFFERINGS

OF STATE AND LOCAL GOVERNMENTS

THE LESS RAPID expansion of plant and equipment by corporations, together with their increased ability to finance from such internal sources as depreciation, depletion, and retained earnings, has diminished the amount of corporate security offerings in the past two years. Some of the slack in capital markets that otherwise would have resulted from the continued high rate of personal saving has been absorbed by the expanding capital requirements of state and local governments. In 1952, security offerings for new capital purposes by state and local governments were estimated to have been 4.4 billion dollars, or 32 per cent of the total of corporate and state and local government offerings combined. Corporate offerings were at a record level in that year. The following year, state and local governments sold 5.6 billion dollars of securities and, as corporate offerings declined, the proportion of combined offerings accounted for by governmental issues increased to 38 per cent. Data for the first five months of 1954 indicate that the trend continues to prevail as the offerings of state and local governments have advanced to 47 per cent of the total.

The rising demand for capital funds originating from state and local governments is explained, broadly, by the desire of the public to maintain and improve the quality of services received from government, by the fact that current revenues are insufficient to finance large projects, and by the development of procedures which have enabled financing to be accomplished outside the usual restrictions on state and local debt. Much of the public demand for services has been related to specific developments. The increasing number of motor cars has generated requirements for roads, bridges, expressways, and parking facilities. The growing population, much of which is housed in suburban communities, has created demands for new water and sewage systems, schools, hospitals, streets and sidewalks, recreational facilities, and public buildings for fire and police departments and government administrative offices. Expenditures for these purposes have been supplemented by outlays for public housing, flood control, veterans' assistance programs, airports, and many other purposes.

An estimate of the extent to which these developments are requiring market financing by state and municipal governments in the Tenth District can be made by examination of the volume and purposes of new financing in recent years. In 1952, total security offerings of these District governmental units amounted to 169 million dollars, or approximately 4 per cent of such securities sold in the Nation. Last year, when state and municipal offerings in the country increased, new financing by public bodies in the District slipped to 164 million dollars, or to 3 per cent of the total. In the first six months of 1954, however, state and local governments in the District sold 125 million dollars of bonds, and

the additional amount now in prospect for the second half of the year virtually assures a record volume for the year as a whole.

The accompanying table indicates the distribution of governmental financing in the states and parts thereof that are included in the Tenth District. The volume of financing has been largest in Nebraska during the 30-month period, and that state and the Tenth District portion of New Mexico have shown the greatest increases in the current year. The major part of the securities offered by government units in Nebraska this year financed the expansion of two public power projects. New issues of securities in Kansas, Oklahoma, and western Missouri have been sold at rates that promise to establish high records for the year. Projects planned for the remainder of the year assure that the volume in the District as a whole will exceed all previous years.

New Security Offerings of State and Local Governments, Tenth District States

In millions of dollars

State	1952	1953	6 Mos. 1954	Total
Colorado	46.8	29.0	12.8	88.6
Kansas	14.0	30.9	19.1	64.0
Missouri*	26.3	39.7	23.9	89.9
Nebraska	25.5	28.5	40.5	94.5
New Mexico*	7.5	5.9	8.7	22.1
Oklahoma*	45.6	23.5	18.4	87.5
Wyoming	3.0	6.1	1.2	10.3
Total	168.8	163.7	124.8	456.9

*Tenth District portion only.
Note: Items may not add to total, due to rounding.
SOURCE: Weekly issues of *The Commercial and Financial Chronicle.*

The second table indicates the purposes for which state and local governments have issued securities in the 30-month period. School buildings and equipment have been the major source of demand for capital funds, reflecting the increased school population at the grade and high school level and a significant amount of financing of college and university facilities. The second largest requirement has been for improvement and extension of water, sewage, and drainage systems, a requirement that has originated primarily from the growth of suburban communities. Construction of streets, highways, and bridges has required comparatively little financing through sales of securities, funds having been available from other sources to finance these improvements. No major toll road project was financed in the period. Included in the miscellaneous category were bonds sold to finance park improvements, swimming pools, auditoriums, voting machines, and bonds for which the purpose was not identified.

Inspection of data on the award of large construction contracts indicates that most of the projects for which funds were raised earlier this year will be started in the second half of the year. Though these expenditures are not large compared with private and Federal capital projects in the District, their rising volume in coming months will tend to strengthen many parts of the regional economy.

New Security Offerings of Tenth District State and Local Governments, by Purpose

In millions of dollars

Purpose	1952	1953	6 Mos. 1954	Total
School buildings and equipment	67.9	53.5	34.0	155.4
Water, sewage, and drainage systems	23.3	44.1	29.0	96.4
Streets, highways, bridges	38.9	12.4	6.8	58.1
Public housing authority	(	33.0	4.6	
Other public buildings	(38.2	7.2	39.3	147.0
Miscellaneous	(	13.6	11.1	
Total	168.8	163.7	124.8	456.9

Note: Items may not add to total, due to rounding.
SOURCE: Weekly issues of *The Commercial and Financial Chronicle.*

URANIUM ... *The Magic Metal*

Several Rich Strikes Highlight Steady Expansion In the Colorado Plateau Region

A NUMBER of uranium discoveries have been made in the Colorado Plateau region in recent months and the possibility of developing quick fortunes through similar discoveries has caused a boom which some writers compare to that of the famous gold rush days of 1849. Professional prospectors and amateur fortune hunters are roaming the Colorado Plateau region looking for the "magic metal." A number of large corporations also have joined in the search. This list includes such firms as Anaconda Copper Mining Company, Climax Molybdenum Company, Lehigh Coal and Navigation Company, and the Atchison, Topeka and Santa Fe Railroad, to name but a few. Speculative stock ventures have accompanied the increase in uranium activity and the shares of several newly formed companies doubled or tripled in value even before any reasonable evaluation of their holdings could be made. This article will survey briefly the uranium industry and attempt to evaluate the social and economic impact of the uranium boom on the Colorado Plateau region.

Markets for Uranium

The main use for uranium continues to be that of a feedstock for atomic explosions. The Atomic Energy Commission has a capital investment in plants of about $6 billion, and it appears likely that the Government's demand for uranium will remain strong for some time. Although experimentation with nuclear materials continues to expand in fields such as medicine and food preservation, the possibility of utilizing atomic energy in generating electric power offers the greatest prospect for expanding the use of uranium in the future. For example, one pound of uranium, when converted to energy, will produce the heat equivalent of 2.8 million pounds of coal. The possible use of atomic energy will be determined by the technical efficiency achieved in converting this tremendous amount of potential energy for practical purposes.

The accompanying table shows that world reserves of uranium and thorium, the two natural elements which are fissionable or may be transmitted into fissionable material, are dwarfed in volume by world reserves of conventional fuels. However, the potential energy available from nuclear fuels is estimated to be 23 times greater than that of conventional fuels. Considerable progress has been made in the last few years toward overcoming the problems involved in unlocking the vast potentials of atomic energy for peacetime applications. A small-sized breeder reactor—a device believed to offer the greatest promise in producing commercially competitive electric power—has been operating in Idaho for more than two years, and a commercial atomic power plant will be built near Pittsburgh. While it is likely that electric power generated from atomic energy will not become competi-

World Reserves of Conventional Fuel and Nuclear Energy

Fuel	World Reserves	Total Energy, BTU[1]
Coal	3,482 billion tons	72.2×10^{15}
Oil	1,241 billion barrels	7.6×10^{15}
Gas	560 trillion cubic ft.	0.6×10^{15}
Total conventional		80.0×10^{15}
Uranium	25 million tons	$1{,}700 \times 10^{15}$
Thorium	1 million tons	71×10^{15}
Total nuclear		$1{,}800 \times 10^{15}$

[1]BTU = British Thermal Unit. 10^{15} = 1,000,000,000,000,000.
SOURCE: Atomic Energy Commission as reported in the *Mining Congress Journal*, June 1954.

tive with other fuels for a decade or possibly longer, more optimistic forecasts have been made. For example, the general manager of General Electric's atomic products division stated at a recent meeting of the Atomic Industrial Forum, Incorporated, that his firm had the design and cost figures on two types of reactors which "will generate electricity at competitive costs, possibly within five, certainly within ten years." His figures are based on a plant to serve a city of 200,000 population. The cost of the initial nuclear fuel is estimated as high as $40 million, but the cost of the electricity could be 6.7 mills per kilowatt hour compared to 6.9 mills for electricity produced by some coal plants today. Nuclear power probably will replace conventional power abroad much sooner than in this country since the cost of electricity now produced there is higher. England will have an atomic power plant in operation by late 1955 which is expected to generate electricity at about twice the conventional cost. Britain's reserves of low-cost fuel are diminishing, and a British official has predicted that uranium will be substituted for coal in all of Britain's industries within 30 years.

Although the potential uses for uranium are many, the greatest incentive for the present exploratory activity in this country is the AEC's subsidy programs. The Commission has a guaranteed minimum price schedule for uranium ores which will remain in effect until March 31, 1962. In addition to payments based on the quality of the ore, the schedule includes allowances for development and haulage. The Commission also pays an initial bonus on the first 10,000 pounds of uranium oxide produced from a mine, which may amount to as much as $35,000. The bonus program will be in effect at least through February 1957. As of July 1, 1954, more than $3.6 million had been paid by the AEC to miners under the bonus program.

Sources of Uranium

The most concentrated source of uranium is pitchblende, a variety of uraninite. Pitchblende may contain as much as 80 per cent uranium oxide and a vein only one-half inch wide would be profitable to mine. Several mines in Canada and the Belgian Congo contain a remarkable concentration of pitchblende and yield a large percentage of the world's uranium. About 20 minerals are classified as secondary sources of uranium. The best known of these is carnotite; others are roscoelite, copper-uranium, and vanadium-uranium. From a mining viewpoint, these ores are similar. The uranium oxide content ranges from 0.1 to 1 per cent, with the average nearer the lower figure. Uranium also is found in uraniferous phosphates and lignites, and the AEC has encouraged recovery from these, especially as a by-product of the phosphate fertilizer industry. The concentration of uranium oxide in phosphates is quite low, ranging only from two to four tenths of a pound per ton of rock. Uranium is recovered in this manner mainly from the phosphate deposits of Florida. The phosphorous formations of Utah, Idaho, Wyoming, and Montana also are a source of commercial phosphatic materials. The production of by-product uranium from western phosphates is contemplated in the future.

The United States continues to be dependent on foreign sources for a major portion of its uranium supply. The principal foreign sources are the Belgian Congo, Canada, and the Union of South Africa. Recent discoveries in Australia indicate a new source will be available there in the future. Domestic output is sufficient, however, to place U. S. production second only to that of the Belgian Congo.

At present, the principal source of domestic ore is the Colorado Plateau area. Other ore is produced from the phosphates in Florida mentioned above. Some uranium also is being

mined in the Black Hills region of South Dakota and Wyoming. Several promising discoveries have been made in central and eastern Wyoming, especially in Fremont County. Although production in Wyoming remains limited, prospecting has expanded in the past year. Wyoming's state land commissioner stated recently that about one third of the land in the state was under uranium lease at the end of June this year. The uranium leases issued or applied for there in the week ending June 27 represented twice the state acreage under uranium lease a year ago.

Colorado Plateau

Most of the deposits of the Colorado Plateau region are of the carnotite type, although deposits of pitchblende are being mined in the Marysvale, Utah, area which is just west of the Colorado Plateau region proper. The plateau region is one of the least populated areas in the country, with the population density in some counties as low as five persons for every 10 square miles, compared to a national average of 499 per 10 square miles. Cattle grazing and mining were the main economic pursuits in the area prior to the uranium boom. The Denver and Rio Grande railroad passes through Grand Junction, Colorado, on the north and the Santa Fe railroad through Grants, New Mexico, 250 miles to the south. A narrow gauge railroad through Durango, Colorado—shown on the map—is the only other railroad serving this vast area.

While the uranium boom may compare to the gold rush days, the art of prospecting has advanced considerably since the days of '49. Early uranium prospectors used Geiger counters, but these have been replaced by more sensitive instruments in the more exacting searches. Scintillometers are used in low flying airplanes to detect likely areas of radiation. They also are dropped down drill holes to detect radioactivity and are carried by prospectors on foot. Atomic Energy Commission geophysicists employ seismographs, which register the passage of shock waves, and instruments for measuring the action of electrical energy in the earth. Geochemical investigations also are used for sampling trace elements in the ground to determine whether their pattern in a given area may reveal the possible presence of uranium nearby. Most of the surface deposits of ore on the plateau have been discovered and prospectors are drilling core holes in search of uranium, some as deep as 3,500 feet. Private companies are spending about $3 million a year drilling holes. The AEC made chemical analyses of 20,000 ore samples last year. In addition, the AEC and the U. S. Geological Survey drilled 7,186 exploratory holes last year, of which 5,810 were

Colorado Plateau Region

△ Uranium ore processing mill.

on the Colorado Plateau. The Commission also searches for uranium by conducting aerial surveys of the area. Areas of radioactivity are noted on a map by the use of a scintillometer. These areas are posted and form the basis of private hunts. While most discoveries continue to be small, 15 discoveries have been made on the plateau where the ore deposits exceeded 100,000 tons. In 1950, there were only four such known deposits.

The type of mining operations has shifted in the past few years. While most mining once was from rims of canyons or through inclined shafts, many miners have begun to sink vertical shafts as surface deposits have become depleted. Some of these shafts are as deep as 600 feet. There are about 530 mines on the plateau, most of which employ fewer than 10 men. These mines now ship around 10 tons of ore a day. Exact production figures are not released, but the AEC has stated that production is doubling every 18 months. Besides guaranteeing a market, the AEC also assists the miners by building access roads. To date, about 1,000 miles of roads have been built in the plateau region at a cost of some $5.7 million.

There are eight mills located on the Colorado Plateau and another is expected to be completed at Shiprock, New Mexico, by the end of the year. The AEC has indicated additional mills will be built at Moab and Hite, Utah, and Bedrock, Colorado, in the near future. Mill expansions also have been announced at Grants, New Mexico; Monticello, Utah; and Durango, Colorado. Most mills use about 200,000 to 300,000 tons of ore a year and employ from 150 to 250 men. The AEC usually contracts to purchase a mill's output for a 5-year period. The mills in Colorado handle mostly vanadium-uranium type ores, while the mill at Grants handles limestone deposits. The milling methods are slightly different and the costs vary between individual mills. Therefore, each contract is negotiated separately and the prices actually paid are not made public. The AEC also engages in research on new recovery methods for extracting uranium in an attempt to derive more economical processing methods.

Economic and Social Impact

Since much of the information on uranium production is secret, any measure of the economic impact of the uranium boom on the area is necessarily incomplete. However, retail sales, employment, and population estimates, as well as other business indicators, point up the magnitude of the expansion. For example, the AEC and the U. S. Geological Survey had 10 people employed in the area in 1948, while there were 877 employed in November 1953. In addition, the AEC has spent about $3 million in Grand Junction for buildings.

Estimates of population increases made by various local agencies since the 1950 census indicate that the population of Grand Junction (14,504 in 1950) has increased one tenth; Monticello (1,172), one fifth; Rifle (1,525) and Durango (7,459), one third; and Moab (1,274), one and a half times. The Bureau of Business Research of the University of New Mexico estimated the 1950-1953 increase in population in McKinley County, New Mexico (27,451), at 18 per cent and in San Juan County, New Mexico (18,292), at 56 per cent. Although part of the increase in these counties was attributed to uranium prospecting and mining, the rapid natural increase of the Navajo Indian tribe and the development of natural gas reserves in San Juan County also were factors. Indications are that population is continuing to expand. In Grand Junction, an estimated 50 new families have moved into town during the last few months, and over half of these were connected with uranium firms or agencies. In Moab, approximately 139 uranium companies were operating this sum-

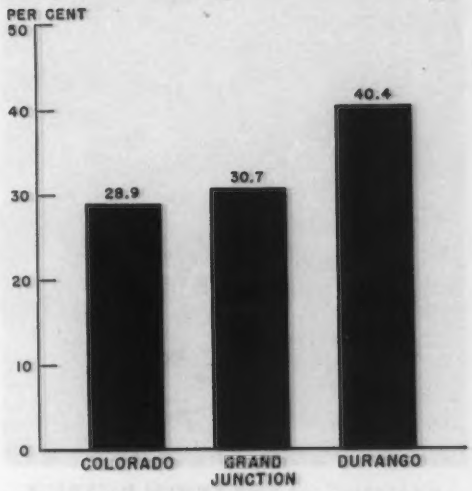
mer, and because of the influx in population, adequate housing was not available within 50 miles of the town. Consequently, people have had to resort to tents and trailers for living accommodations. Several multi-million dollar housing developments are in the planning stage. Proposed and approved construction in the small community of Moab for 1954 is about $5 million and estimates for 1955 are considerably higher. Local businessmen freely predict Moab's population will reach 5,000 within a year or so.

Some local communities are finding it difficult to provide adequate municipal services for the population growth. In Moab, it was necessary to take an official census since the town was at its limit of bonded indebtedness relative to 1950 population. The local school district there has approved a $600,000 bond issue for new schools. The people of Grand Junction found it necessary to spend over $3 million on new schools last year and the city of Durango has approved a school bond issue of approximately $1 million.

Total nonfarm employment information, available for Grand Junction and Durango and for San Juan and McKinley Counties, also points up the expansion that has taken place in the area in recent months. Employment in Grand Junction in June 1954 was 41 per cent above the June 1953 level. Employment increased about one fourth in McKinley and San Juan Counties in the past year. Because of cutbacks in other types of mining activity and in sawmilling, June employment in Durango was substantially below the June 1953 level but had increased about 10 per cent from the low level reached in February of this year.

Retail sales in the Colorado counties on the plateau during 1953 were about 5 per cent above 1952, while sales in the entire state increased only 3 per cent. Sales receipts for the first half of 1954 for the important plateau

Change In Retail Sales, 1949 to 1953

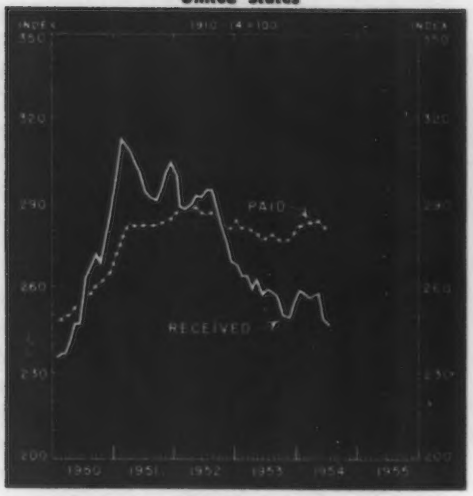


SOURCE: Bureau of Business Research, University of Colorado.

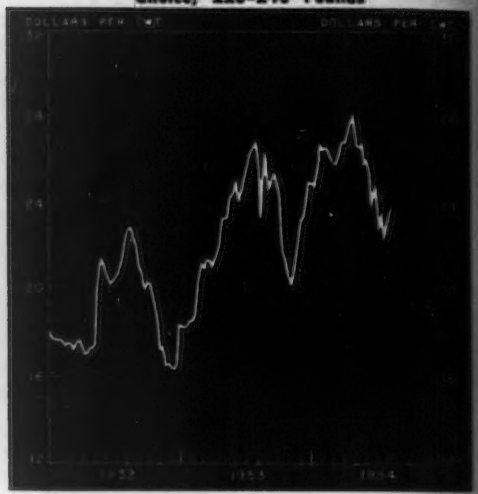
city of Grand Junction indicate that sales in 1954 will exceed those of 1953 in that area. In New Mexico, retail sales during the first five months of this year, compared with the like period of 1953, increased 24 per cent in San Juan County and remained unchanged in McKinley County, while sales in the entire state declined 5 per cent. The accompanying chart indicates that sales increases since 1949 in the uranium towns in Colorado also exceeded the rather substantial increase for the state as a whole.

While the uranium deposits on the Colorado Plateau are not as high in quality as some in other parts of the world, their extent is much greater than was realized even two years ago. It has been estimated that the Government and private companies will spend about $50 million in the Colorado Plateau region this year in prospecting for and developing uranium claims. The effect of this spending undoubtedly will continue to be reflected in the economy of the area.

FARM PRICES
United States



HOG PRICES, OMAHA
Choice, 220-240 Pounds



BANKING IN THE TENTH DISTRICT

District and States	Loans				Deposits			
	Reserve City Member Banks		Country Member Banks		Reserve City Member Banks		Country Member Banks	
	July 1954 Percentage Change From							
	June 1954	July 1953	June 1954	July 1953	June 1954	July 1953	June 1954	July 1953
Tenth F. R. Dist.	+3	+9	+4	+7	−1	+6	+1	+3
Colorado	+1	+8	+1	+1	+1	+4	0	+6
Kansas	−1	+6	+12	+6	−4	+7	+3	+1
Missouri*	+8	+13	+1	+9	−1	+7	0	+3
Nebraska	+3	+18	0	+10	+3	+2	+1	+1
New Mexico*	**	**	−1	+6	**	**	+4	+5
Oklahoma*	+1	+2	+9	+8	−4	+7	−1	+6
Wyoming	**	**	−1	+5	**	**	−1	+5

*Tenth District portion only. **No reserve city banks in this state.
Note: Due to the reclassification of Lincoln and St. Joseph banks on March 1, 1954, from reserve city to country bank status, data for July 1953 have been adjusted to produce comparability with current figures.

PRICE INDEXES, UNITED STATES

Index		July 1954	June 1954	July 1953
Consumer Price Index	(1947-49=100)	115.2	115.1	114.7
Wholesale Price Index	(1947-49=100)	110.4	110.0	110.9
Prices Rec'd by Farmers	(1910-14=100)	247	248	260
Prices Paid by Farmers	(1910-14=100)	280	282	278

TENTH DISTRICT BUSINESS INDICATORS

District and Principal Metropolitan Areas	Value of Check Payments		Value of Department Store Sales		*Value of Residential Bldg. Permits	
	Percentage change—1954 from 1953					
	July	Year to date	July	Year to date	July	Year to date
Tenth F. R. Dist.	+3	+3	+9	−2	+59p	+29p
Denver	+1	+2	+2	−2	+65	+25
Wichita	+19	+4	+7	−7	+122	+43
Kansas City	0	−1	+12†	−2†	−36‡	+11‡
Omaha	+3	+7	+7	+4	+142	+50
Okla. City	+7	+8	+19	+3	+57	+69
Tulsa	+1	+5	+20	−1	+71	+37

*City only. †Kansas City, Mo., only. ‡Kansas City, Mo., and Kans. p Preliminary.